

Illinois State University

ISU ReD: Research and eData

Faculty Publications – Communication
Sciences and Disorders

Communication Sciences and Disorders

2010

The Effects of Supplemental Joint Storybook Reading on Preschool Students' Use of Strident Sounds: A Preliminary Investigation

Jennifer C. Friberg

Illinois State University, jfribe@ilstu.edu

Katie K. Lund

Follow this and additional works at: <https://ir.library.illinoisstate.edu/fpcsd>



Part of the [Communication Sciences and Disorders Commons](#)

Recommended Citation

Friberg, Jennifer C. and Lund, Katie K., "The Effects of Supplemental Joint Storybook Reading on Preschool Students' Use of Strident Sounds: A Preliminary Investigation" (2010). *Faculty Publications – Communication Sciences and Disorders*. 6.
<https://ir.library.illinoisstate.edu/fpcsd/6>

This Article is brought to you for free and open access by the Communication Sciences and Disorders at ISU ReD: Research and eData. It has been accepted for inclusion in Faculty Publications – Communication Sciences and Disorders by an authorized administrator of ISU ReD: Research and eData. For more information, please contact ISUReD@ilstu.edu.

The Effects of Supplemental Joint Storybook Reading on Preschool Students' Use of Strident Sounds: A Preliminary Investigation

Jennifer C. Friberg

Illinois State University, Normal

Katie K. Lund

Oswego Community Unit School District 308, Oswego, IL

For most children, development of an adult-like phonological system is something that occurs gradually, following a predictable, rule-based course with few instances of individual difference. From the earliest moments in a child's infancy through their early school-age years when phonological development is thought to culminate, children are engaged in an almost continuous organization and classification of speech sounds that are governed by an innate, universal set of phonological processes that constitute a child's phonology, or speech sound system. These phonological processes categorize sounds within a language by similar features (e.g., stop sounds are produced by stopping airflow through the oral cavity,

whereas strident sounds are produced by using a continued airflow).

When a child's phonological development does not follow a typical progression, a phonological disorder may result, indicating that the child in question has acquired nonstandard phonological rules and has categorized his or her speech sounds into processes incorrectly. Commonly, processes produced in error by children with phonological disorders can include any or all of the following: structure processes (e.g., final consonant deletion, syllable deletion, cluster reduction, and reduplication), substitution processes (e.g., replacing one sound with another within a word), changes in place processes (e.g., atypical placement of

ABSTRACT: Purpose: The purpose of this study was to determine the impact of adding supplemental, joint storybook reading to existing cycles-based phonological remediation on the speech intelligibility of a group of preschool children with phonological disorders.

Method: Sixteen preschool children, ages 3;8 (years; months) to 5;0, with moderate to severe phonological disorders served as the participant group for this study. The treatment group received treatment in the form of supplemental joint storybook reading using books with a high frequency of strident sounds within the text of the story. Independent-samples *t* tests were used to study quantitative differences in the control and treatment groups following treatment.

Results: Results indicated a significant difference in the presence of stridency observed in participants, with the treatment group showing greater positive change in the presence of stridency in their speech at completion of the study.

Conclusion: Results from the study suggest that exposure to focused auditory input in the form of supplementary joint storybook reading, combined with traditional cycles-based phonological remediation, is an effective manner for improving speech intelligibility in children with moderate to severe expressive phonological disorders.

KEY WORDS: phonological intervention, joint storybook reading, supplemental treatment

sounds in the oral cavity for phonetic production), changes in manner processes (e.g., atypical manner of production for a sound), and changes in voicing processes (e.g., atypical voicing for the production of a sound; Bauman-Waengler, 2004).

Typically, if a phonological disorder is going to emerge, it will do so between the ages of 3 and 5, when the greatest amount of change occurs within a child's phonological system (C. O'Keefe, personal communication, 1993). Quite commonly, the most easily identifiable effect of a phonological disorder is diminished speech intelligibility. However, beyond speech intelligibility, there is another, well-documented long-term possible effect of phonological disorders: difficulty with reading and spelling later on in school (Bird, Bishop, & Freeman, 1995; Larivee & Catts, 1999; Lewis & Freebairn, 1992). Overall, children with phonological disorders are at risk for developing substandard phonological awareness skills that can adversely impact their future academic performance.

Treatment of Phonological Disorders

Phonological processes produced in error by a child must be adequately assessed and identified in order for a speech-language pathologist (SLP) to plan effective intervention. Many different methodologies exist to treat phonological disorders. Brackenbury (2004) identified five specific practices of phonology intervention that are standard across the most commonly used treatment approaches:

- Determine the phonological rules and/or patterns a child is currently using.
- Determine where the breakdown in intelligibility is occurring.
- Select appropriate treatment targets.
- Apply a mixture of production and auditory practice.
- Expect some spontaneous generalization to sounds not focused on, but still within the same phonological rule pattern.

Integrating these intervention practices using somewhat different methodologies, several approaches have emerged as commonly used treatment strategies for children with phonological disorders. These approaches include maximal opposition therapy (Gierut, 2001), multiple opposition therapy (Williams, 2000), the cycles-based phonological remediation approach (CPRA; Hodson & Paden, 1991), and metaphon therapy (Howell & Dean, 1995).

Maximal opposition therapy uses targets for treatment that have features that differ as much as possible (are maximally opposed). Multiple opposition therapy uses large treatment sets to simultaneously confront phonologically impaired children with many errors at once to encourage understanding of a broad range of phonemic contrasts (Gierut, 2001; Williams, 2000). CPRA uses a cyclical treatment pattern combined with focused auditory input to systematically create a hierarchical treatment plan based on individual phonological processes (Hodson & Paden, 1991). These three phonological treatment approaches are notable in that they each have proven efficacy, yet focus only on phonology-based skills

within the context of intervention. The fourth approach to treating phonological disorders, metaphon therapy, uses phases of intervention to systematically treat phonological disorders from a metaphonological approach, that is, to combine the need to produce sounds with the need to simultaneously provide explicit instruction in the area of phonemic awareness (Howell & Dean, 1995). It should be noted that each of these intervention methods is currently used in the treatment of phonological disorders in young children, and although they are different in many discernible ways, they do emphasize production practice, focused auditory input, and treatment based on patterns of error.

Taking into account the fact that children with phonological disorders are at risk for future reading and language disorders, several researchers have actively advocated for some sort of combination of phonological and language-based intervention to address both the current and future needs of children with phonological disorders. Specifically, the inclusion of language intervention within the context of phonological intervention has been found to be effective both within small groups (Hoffman, Norris, & Monjure, 1990) and within preschool classrooms (Montgomery & Bonderman, 1989). In fact, Tyler and Sandoval (1994) found that a combination of phonological and language-based intervention yielded the best outcomes for preschool children. Due in large part to these findings, coupled with the realization that phonology and language appear to be closely related, Creaghead and Hodson (2006) advocated for the transition of phonological intervention to more natural contexts and suggested that with careful selection of materials, language-based skills such as peer interaction and shared book reading can be effective ways to make positive change in a child's phonology.

Purpose of Current Study

It has been determined that children with phonological disorders can be treated effectively using a cycles-based treatment approach within a classroom context (Montgomery & Bonderman, 1989). However, with the knowledge that children with phonological disorders are at risk for developing difficulties with reading and spelling, along with recommendations from recent research that children with phonological disorders be exposed to intervention activities directed at laying the "groundwork for later reading acquisition" (Larivee & Catts, 1999, p. 126), the inclusion of language-based prevention activities within the context of phonology intervention has become a necessity.

Creaghead and Hodson (2006) suggested that words naturally occurring within the context of literacy-based intervention can be used as the basis for phonological intervention if they are selected carefully for the patterns emphasized within the activity and the frequency of occurrence of targeted patterns. Due to the known benefits of shared storybook reading (Whitehurst et al., 1988), Creaghead and Hodson advocated for the use of books within phonology intervention, yet to date, the use of shared storybook reading within the context of traditional cycles-based phonological intervention has not been closely scrutinized.

Thus, the purpose of this study was to take a phonological treatment approach with proven efficacy—classroom-based CPRA—and add the element of supplementary storybook reading to determine the impact of this combined method of treatment on the speech intelligibility of a group of preschool children with phonological disorders. Specifically, this study focused on one specific phonological process, that of stridency, to determine the effects of supplementary joint book reading on the presence of stridency in the speech of preschool children with phonological disorders.

METHOD

Participants

Participants in this study consisted of 16 preschool-age children (12 males, 4 females) enrolled in three separate phonology-based preschool classrooms located within a large, suburban public school district in the midwestern United States. Participants ranged in age from 3;8 (years; months) to 5;0, with a mean age of 4;4. All participants within the study were recruited from a half-day, phonology-based preschool program wherein an SLP (serving as both clinician and classroom teacher) provided CPRA phonology intervention within a regular classroom environment for the duration of the academic school year. Children from these specialized preschool classes were selected for inclusion in this study due to the fact that they had similar diagnoses (moderate to severe phonological disorder characterized by stridency deletion, among other phonological processes) and received intervention that was as homogeneous in nature as possible (the same methodology delivered within the same group structure by the same agent in the same place). All children spoke English as their primary language and passed a hearing screening before the study began.

Procedure

After obtaining consent from the parents of the study participants, we divided the participants equally into one of two groups: the treatment group and the control group. The treatment group consisted of eight children who were enrolled in the same phonology-based preschool classroom. The control group consisted of eight children from two different phonology-based preschool classrooms. A pretest was developed to measure the presence of a particular phonological process within each participant's speech before treatment. Rather than focus on all phonological processes within the typical phonology of the English language, it was determined that the focus of this study would be on one individual process: stridency. This decision was based on the fact that the substitution processes of stridency reduction and stridency deviation are commonplace in the speech of preschool-age children with phonological disorders. Of the 42 phonemes used in the production of English, eight specific sounds are considered to be strident sounds characterized by "turbulent airflow striking the back

of the teeth" (Hodson, 2007, p. 14). These sounds, /f, v, s, z, ʃ, ʒ, tʃ, dʒ/, are typically missing or are produced inappropriately by young children with unintelligible speech (Hodson, 2007; Hodson & Paden, 1991). Because most children with phonological disorders omit or substitute these sounds within their speech, these sounds make acceptable targets during intervention.

Thus, the pretest used in this study was created to examine participants' use of strident sounds in the initial and final positions of words. The test contained 25 words, with each word containing two strident sounds (one in the initial position of the word and one in the final position of the word), yielding a total of 50 strident sounds. A list of stimulus words used on the pretest is provided in the Appendix.

We administered the pretest by asking participants to repeat each stimulus word on the pretest. Participants' responses were transcribed phonetically for analysis. Because phonology intervention is based on facilitating the emergence of sound patterns (Hodson & Paden, 1991), participant responses were judged on the presence of strident sounds in the production of each stimulus word rather than on the accuracy of production. Thus, if a participant used a strident sound in the initial and/or final position of a pretest word, stridency was judged to be present, regardless of whether the strident sound used was produced accurately. For example, if the target word was /fɪʃ/ (*fish*) and the participant produced /bɪf/ (*biff*) instead, he or she would receive no credit for the presence of stridency in the initial position of the word but would receive credit for the presence of stridency in the final position. Participants' overall pretest score for the presence of stridency was determined as a percentage of strident sounds present out of 50, as there were 50 opportunities for participants to use strident sounds in the pretest.

Following completion of the pretest, the eight participants in the treatment group received supplementary treatment that provided focused auditory input in the form of exposure to interactions centered around storybooks containing a high frequency of strident sounds. Due to the fact that all participants attended a school adhering to CPRA, efforts were made to develop a treatment plan for this supplemental treatment that was theoretically similar to CPRA. Thus, a modified cycles approach based on traditional CPRA for children with phonological disorders (Hodson & Paden, 1991) was developed as the basis for this study's treatment phase wherein treatment was applied to the treatment group over the course of 12 weeks to provide ample opportunity for generalization of targeted skills. As shown in Table 1, participants in the treatment group received treatment in alternating 3-week rotations: Participants received 30 min of treatment per week for the first 3 weeks of the study, followed by 3 weeks with no treatment to allow for generalization. A second cycle of treatment was applied, again for 30 min per week for 3 weeks, and then a final 3-week period with no treatment followed.

Each supplementary treatment session began with the reading of a children's storybook using a dialogic approach, wherein reading a story, asking open-ended questions of children, talking about a book's pictures, engaging children

Table 1. Study schedule.

Week	Description of treatment activity
1	Pretesting of treatment and control groups
2–4	Intervention – Cycle 1
5–7	No Intervention – Cycle 1
8–10	Intervention – Cycle 2
11–13	No Intervention – Cycle 2
14	Posttesting of treatment and control groups

in discussion and conversation about the book in question, and using strategies to expand a child's utterances are all used to facilitate interaction between the story and the children exposed to it (Nelson, 2010). As suggested by Creaghead and Hodson (2006), specific books used in the study were selected based on the high frequency of occurrence of various strident sounds. Selected books included *One Fish, Two Fish, Red Fish, Blue Fish* (Seuss, 1960), *Mister Seahorse* (Carle, 2004), *Naughty Little Monkeys* (Aylesworth & Cole, 2003), *Five Little Monkeys Wash the Car* (Christelow, 2004), *Mr. Wishy-Washy's Farm* (Cowley, 2003), and *There Was An Old Lady Who Swallowed a Bat* (Colandro, 2005). Books were considered to have a high frequency of strident sounds if more than 100 strident sounds were included within the published version of the book. A list of the six books used, along with information related to the frequency of various strident sounds included within each story, is provided in Table 2.

During supplementary treatment sessions, each book was read on the story-time carpet within the participants' regular preschool classroom setting. Each book was read aloud to participants and was then reviewed and discussed in depth to ensure that the participants understood the story and its individual parts. This provided participants in the treatment group with consistent, focused auditory input with regard to strident sounds throughout each session. Following these storybook readings and discussions, a brief activity related to the story was completed to provide additional exposure to strident sounds over the course of the treatment session.

Following completion of the 12-week treatment period, all participants were posttested using the same stimulus words and procedures that were applied during pretesting. All pretesting, treatment, and posttesting was administered by a second-year speech-language pathology graduate student who was directly supervised by an American Speech-Language-Hearing Association-certified SLP. No single participant missed more than one treatment session due to absence/illness.

Table 2. Stimulus book information by frequency of occurrence of strident sounds.

Book	/f/	/v/	/s/	/z/	/ʃ/	/ʒ/	/tʃ/	/dʒ/	Total # stridents
<i>One Fish, Two Fish, Red Fish, Blue Fish</i> (Seuss, 1960)	73	51	133	87	48	0	0	4	396
<i>Mister Seahorse</i> (Carle, 2004)	27	13	149	35	12	0	9	3	248
<i>Naughty Little Monkeys</i> (Aylesworth & Cole, 2003)	23	8	56	52	14	14	10	3	180
<i>Five Little Monkeys Wash the Car</i> (Christelow, 2004)	22	20	80	50	10	0	2	0	184
<i>Mr. Wishy-Washy's Farm</i> (Cowley, 2003)	18	14	52	39	35	0	4	4	166
<i>There Was an Old Lady Who Swallowed a Bat</i> (Colandro, 2005)	1	0	50	12	37	0	7	6	113

RESULTS

In this study, data collected during the pre- and posttest assessments were analyzed to compare the presence of stridency in two groups of preschoolers with phonological disorders: the treatment group, who received supplementary focused auditory input through exposure to books with a high frequency of strident sounds, and the control group, who did not have any additional auditory input beyond regular classroom-based exposure to phonology targets.

Table 3 displays the mean scores of each participant group on stridency measures collected at pretest and posttest intervals along with results of independent-samples *t* tests used to assess between-group differences. Tables 4 and 5 provide pretest and posttest scores for each participant, arranged by treatment or control group membership.

Percentages for the presence of stridency were calculated following pre- and posttesting. Pretesting results indicated fairly uniform performance across the two groups, $t = 0.0956$, $df = 12$, $p = .9254$, with the control group's performance ($M = 76.0$, $SD = 18.3$) reflecting a <1 percentage point advantage over the treatment group's performance ($M = 75.14$, $SD = 15.2$).

A comparison of posttest data indicated a large difference in posttreatment mean percentages between the control ($M = 81.14$, $SD = 15.7$) and treatment ($M = 93.14$, $SD = 46.7$) groups, for although participants in both the control and treatment groups were observed to make gains in the presence of strident sounds, the treatment group had a mean increase of 17.7 percentage points ($SD = 13.4$) whereas the control group had a mean increase of only 5.14 percentage points ($SD = 5.11$). Based on these descriptive results, an independent-samples *t* test was conducted to compare change in the presence of stridency observed at the conclusion of treatment. Results from this statistical analysis indicated a significant difference, with the treatment group showing greater positive change in this area at completion of the study, $t = 2.3171$, $df = 12$, $p = 0.039$. The effect size of these data ($r = 0.56$) is considered to be moderate (Cohen, 1992), suggesting that the intervention applied to the treatment group improved their intelligibility outcomes. Thus, these data would indicate that supplementary book reading using books with a high frequency of occurrence of strident sounds is associated with higher overall gains in stridency production in students with phonological disorders.

Table 3. Mean scores from pretesting and posttesting with independent-samples *t*-test data.

	Control (n = 8)		Treatment (n = 8)		t(12)	p
	M	SD	M	SD		
Pretest data	76.10	18.30	75.14	15.20	.0956	.9254
Posttest data	81.14	15.70	93.14	46.70	.6444	.5314
Net change	5.14	5.11	17.70	13.40	2.3171	.0390*

**p* > .05.

DISCUSSION

The purpose of this study was to identify whether supplementary storybook reading using books with a high frequency of strident sounds would lead to an increase in the presence of stridency in the speech production of phonologically disordered preschool students engaged in classroom-based CPRA. The relationship between these variables was investigated by comparing the presence of stridency before and after treatment in the speech of participants within the control and treatment groups. As a whole, results from this study suggest that exposure to focused auditory input in the form of supplementary joint book readings, combined with traditional CPRA, is an effective manner to improve speech intelligibility in children with moderate to severe expressive phonological disorders.

Clinical Implications

The primary usefulness of results from this study applies directly to improving the speech intelligibility of children with phonological disorders, as improvements in speech intelligibility lead to improved communication within a child's natural environment. Additionally, more rapid resolution of speech system disorders allows more and higher quality peer interactions, language development, and eventual success academically (Lewis & Freebairn, 1992). Further, while clinicians could certainly add storybook reading to existing phonological intervention, clinicians should be mindful that results from this study could also be used to engage parents as partners within the context of speech and language treatment. By recruiting parents to participate in shared storybook reading, clinicians could potentially facilitate a multifaceted home treatment plan—one that not only

Table 4. Presence of stridency for the treatment group at pretest and posttest.

Participant	Pretest	Posttest	% change
I-1	(47/50) = 94%	(49/50) = 98%	4
I-2	(37/50) = 74%	(46/50) = 92%	18
I-3	(37/50) = 74%	(49/50) = 98%	24
I-4	(49/50) = 98%	(50/50) = 100%	2
I-5	(28/50) = 56%	(49/50) = 98%	42
I-6	(37/50) = 74%	(42/50) = 84%	10
I-7	(50/50) = 100%	(50/50) = 100%	0
I-8	(28/50) = 56%	(41/50) = 82%	26

Table 5. Presence of stridency for the control group at pretest and posttest.

Participant	Pretest	Posttest	% change
C-1	(39/50) = 78%	(38/50) = 76%	-2
C-2	(42/50) = 84%	(43/50) = 86%	2
C-3	(46/50) = 92%	(49/50) = 98%	6
C-4	(35/50) = 70%	(41/50) = 82%	12
C-5	(44/50) = 88%	(45/50) = 90%	2
C-6	(17/50) = 34%	(23/50) = 46%	12
C-7	(44/50) = 88%	(45/50) = 90%	2
C-8	(45/50) = 90%	(48/50) = 98%	8

assists children in developing critical early literacy skills but also aids in improving their overall speech intelligibility. With little effort, books that contain a high frequency of various phonological sound patterns could be identified for use in shared storybook readings. As parents have been shown to be effective agents of intervention to support ongoing, clinician-led treatment when provided with guidance and support from SLPs (Justice & Pence, 2007), allowing parents to partner with clinicians through the introduction of home-based, shared storybook readings could certainly be an effective treatment strategy from both a prevention and an intervention standpoint.

Increasingly, both researchers and clinicians have been made aware of the risk facing young children with expressive phonological disorders with regard to literacy development and overall reading performance (Bishop & Adams, 1990; Larrivee & Catts, 1999). These studies have found that children with expressive phonological disorders have a higher incidence of reading disability than their peers with typically developing speech and language skills. In response to this body of research, the American Speech-Language-Hearing Association (2001) set forth guidelines for SLPs with regard to reading development that specify a clear role in helping literacy skills to develop in children with or at risk for speech and language disorders. These guidelines, coupled with the knowledge that SLPs are agents of *prevention* as well as *intervention*, are clearly indicative that preventative support for the development of literacy-related skills in young children is critical (Hodson, 2006).

Taking these responsibilities into account in light of the results from this study, it is evident that the opportunity for providing prevention services to inhibit or delay the onset of a reading disorder can be embedded with traditional phonological intervention, thus addressing two separate client needs simultaneously. In doing so, young children with expressive phonological disorders could be provided support in developing literacy skills while simultaneously working to improve their overall speech intelligibility. This sort of approach is advocated by Larrivee and Catts (1999, p. 126), who espoused the benefits of activities that allow for heightened "literacy experiences." Specific recommendations for activities to provide this support include activities that can help children develop phonological awareness, print awareness, and literacy experience, each of which could easily be accomplished via shared storybook reading within the context of typical phonological intervention (Larrivee & Catts, 1999; van Kleeck, 2006).

Although this research represented a preliminary examination of the effect of shared storybook reading on the stridency production of preschool-age children, and results were suggestive that such a practice might well lead to improved speech intelligibility for children with phonological disorders, a few limitations of the study must be kept in mind. First, this research was conducted with a small number of participants ($N = 16$) at one site over 12 weeks of implementation. Inquiry with a larger group of participants will be needed to definitively prove the link between the use of supplemental storybook reading on preschoolers' speech intelligibility. Additionally, this study only looked at the phonological pattern of stridency when measuring the presence of sounds. There are many other patterns that could have been measured. That said, this study laid the groundwork for future research to build on looking specifically at the effects of shared storybook reading with a larger number of participants across a more varied group of phonological processes.

REFERENCES

- American Speech-Language-Hearing Association.** (2001). *Roles and responsibilities of speech-language pathologists with respect to reading and writing in children and adolescents* (Guidelines). Rockville, MD: Author.
- Aylesworth, J., & Cole, H.** (2003). *Naughty little monkeys*. New York, NY: Dutton Children Books.
- Bauman-Waengler, J.** (2004). *Articulatory and phonological impairments: A clinical focus* (2nd ed). New York, NY: Pearson Education.
- Bird, J., Bishop, D. V. M., & Freeman, N. H.** (1995). Phonological awareness and literacy development in children with expressive phonological impairment. *Journal of Speech and Hearing Research, 38*, 446–462.
- Bishop, D. M. V., & Adams, C.** (1990). A prospective study of the relationship between specific language impairment, phonological disorders, and reading retardation. *Journal of Child Psychology and Psychiatry, 21*, 1027–1050.
- Brackenbury, T.** (2004, March). *A comparative survey of phonology interventions*. Paper presented at the annual meeting of the Ohio Speech Language Hearing Association, Columbus, OH.
- Carle, E.** (2004). *Mister seahorse*. New York, NY: Philomel Books.
- Christelow, E.** (2004). *Five little monkeys wash the car*. New York, NY: Clarion Books.
- Cohen, J.** (1992). A power primer. *Psychological Bulletin, 112*, 155–159.
- Colandro, L.** (2005). *There was an old lady who swallowed a bat*. New York, NY: Scholastic.
- Cowley, J.** (2003). *Mr. Wishy-Washy's farm*. New York, NY: Philomel Books.
- Creaghead, N., & Hodson, B. W.** (2006, November). *Intervention strategies & activities for preschoolers with speech sound disorders*. Paper presented at the annual meeting of the American Speech-Language-Hearing Association, Miami, FL.
- Gierut, J. A.** (2001). Complexity in phonology therapy: Clinical facts. *Language, Speech, and Hearing Services in Schools, 32*, 229–241.
- Hodson, B. W.** (2006). Identifying phonological patterns and projecting remediation cycles: Expediting intelligibility gains of a 7 year old Australian child. *Advances in Speech-Language Pathology 8*(3), 257–264.
- Hodson, B. W.** (2007). *Evaluating and enhancing children's phonological systems: Research & theory to practice*. Greenville, SC: Thinking Publications.
- Hodson, B. W., & Paden, E. P.** (1991). *A phonological approach to remediation: Targeting intelligible speech* (2nd ed.). Austin, TX: Pro-Ed.
- Hoffman, P. R., Norris, J. A., & Monjure, J.** (1990). Comparison of processes targeting and whole language treatments for phonologically delayed preschool children. *Language, Speech, and Hearing Services in Schools, 21*, 102–109.
- Howell, J., & Dean, E.** (1995). *Treating phonological disorders in children: Metaphon-theory to practice* (2nd ed.). Hoboken, NJ: Wiley & Sons.
- Justice, L. M., & Pence, K.** (2007). Parent-implemented interactive language intervention: Can it be used effectively? *EBP Briefs, 2*(1), 1–13.
- Larrivee, L. S., & Catts, H. W.** (1999). Early reading achievement in children with expressive phonological disorders. *American Journal of Speech-Language Pathology, 8*, 118–128.
- Lewis, B. A., & Freebairn, L.** (1992). Residual effects of preschool phonology disorders in grade school, adolescence, and adulthood. *Journal of Speech and Hearing Research, 35*, 819–831.
- Montgomery, J., & Bonderman, I.** (1989). Serving preschool children with phonological disorders. *Language, Speech, and Hearing Services in Schools, 20*, 76–84.
- Nelson, N. W.** (2010). *Language and literacy disorders: Infancy through adolescence*. Boston, MA: Allyn & Bacon.
- Seuss, T.** (1960). *One fish, two fish, red fish, blue fish*. New York, NY: Random House Books for Young Readers.
- Tyler, A., & Sandoval, K.** (1994). Preschoolers with phonological disorders. *Language, Speech, and Hearing Services in Schools, 25*, 215–234.
- van Kleeck, A.** (2006). *Sharing books and stories to promote language and literacy: A volume in the emergent and early literacy series*. San Diego, CA: Plural.
- Whitehurst, G. J., Falco, F. L., Lonigan, C. J., Fischel, J. E., DeFarshe, B. D., Baldez-Menchacha, M. C., & Caulfield, M.** (1988). Accelerating language development through picture book reading. *Developmental Psychology, 24*, 552–558.
- Williams, L. A.** (2000). Multiple oppositions: Theoretical foundations for an alternative contrastive intervention approach. *American Journal of Speech-Language Pathology, 9*(4), 282–288.

Contact author: Jennifer C. Friberg, Illinois State University, Department of Communication Sciences and Disorders, Campus Box 4720, Normal, IL 61790. E-mail: jfribe@ilstu.edu.

APPENDIX. PRETEST/POSTTEST STIMULUS WORDS

church	scratch
chase	switch
cheese	smudge
jazz	smash
juice	splash
chief	safe
face	surf
fuzz	save
fudge	sleeve
five	size
fish	vase
flash	voice
such	